

Design Standard Concrete Finishing

Purpose:

East Side Union High School District is committed to providing world-class educational facilities for its faculty, staff and students. The performance of indoor floor finishes is an important aspect of this goal. Traditionally, carpeting has been the unchallenged floor finish in occupied spaces such as classrooms and offices. Resilient flooring has also been used. Carpeted floor requires a level of maintenance that is not attainable with lean operating budgets. Resilient flooring also has maintenance requirements that are onerous or environmentally hazardous. The learned result of the implementation of a variety of solutions has resulted in an increasing desire and demand for natural, low-maintenance, sustainable, hygienic solutions that are also aesthetically acceptable – with a growing preference for natural concrete floors.

The purpose of this design standard is to ensure consistency in the provision of natural concrete flooring, therefore achieving a standard of functionality, maintenance, reliability and quality throughout all renovation and new construction projects.

Design Standard:

1. General

ESUHSD's preferred concrete finishing treatment is the RetroPlate Concrete Polishing System[®] (RetroPlate). RetroPlate is a chemically reactive concrete stabilizer; it enhances concrete density and hardness, allowing the floor to be finished to a high cosmetic, marble-like sheen.

Concrete in its natural state is a porous product that is susceptible to efflorescence, spalling and dusting; it does not provide an aesthetic finish, nor is it easily maintained. Through the use of grinding and polishing, in conjunction with the specially formulated RetroPlate product, the need for topical sealers as well as moisture vapor problems are eliminated. The system creates a sealed, hardened, and dustproofed surface, while imparting a beautiful lasting gloss. The seal protects the floor from staining and prevents dusting, while the hardening of the floor increases abrasion resistance by up to 400%.

- A. In addition to bare concrete, RetroPlate works successfully with integral color, acid stains, dyes, dry shake hardeners and cementitious terrazzo. Colored aggregate, recycled glass, and other decorative material can be added into the surface to be exposed during the grinding process.

- B. It is used in conjunction with the RetroPlate Concrete Polishing System for select floors in which:
- 1) the floor is deteriorating and dusting
 - 2) the concrete surface is dull, rough, pitted or raw looking
 - 3) overlays, toppings or expensive recoating is required
 - 4) a marble like, hard shell, maintenance free finish is desired
- C. Maintenance requirements are very basic: an automatic scrubbing machine and mild detergent. There is no requirement over time for replacement, recoating, rewaxing, or repairs.
- D. Benefits include:
- 1) Abrasion resistance: up to 400% greater
 - 2) Impact strength: up to 21% greater
 - 3) Light reflectivity: up to 30% greater
 - 4) Lowest 10-year life cycle cost
 - 5) Low maintenance – dust mop, water and a neutral cleaner
 - 6) No adverse reaction to UV light or water spray
 - 7) Eliminates moisture vapor failures related to floor coverings, avoiding costly vapor migration problems
 - 8) Qualifies for inclusion on Silver, Gold and Platinum LEED
 - 9) Co-efficient of friction – all levels of finish exceed OSHA and ADA recommendations
 - 10) An odorless, non-flammable, non-toxic, and completely “Green” system that it is safe for the environment and safe for applicators, installers and customers. RetroPlate is completely water-based and contains:
 - i. No solvents
 - ii. No VOCs
 - iii. No harmful vapors
 - iv. No harmful fumes
 - v. No toxic ingredientsUse of the RetroPlate System requires:
 - vi. No protective clothing
 - vii. No breathing apparatus
 - 11) The RetroPlate Concrete Polishing System® is installed by a network of factory approved applicators, ensuring quality workmanship.

2. How It Works

The RetroPlate Concrete Polishing System® includes three basic steps performed by certified applicators.

A. Grind

The first step is to grind the floor with industrial strength diamonds. Grinding removes imperfections such as trail marks or scratches and exposes bare concrete by removing existing coating or mastics. Grinding can be light to

heavy depending on the desired level of exposed aggregate. A new floor's colored aggregate, recycled glass or other decorative material can be broadcast into the surface to be exposed during the grinding process.

Grinding levels:

- 1) Class A – Cream: No exposed aggregate
- 2) Class B – Salt and Pepper: 1/16" exposed sand, small aggregate
- 3) Class C – Medium Aggregate: 1/8 – 1/4" exposed aggregate
- 4) Class D – Heavy Aggregate: 1/4 – 1/2" exposed aggregate

B. Densify

The second step is to densify the floor with RetroPlate. RetroPlate penetrates the concrete and chemically reacts to harden and seal floor by filling pores and creating a dense surface. Densification is key to the long-term benefits of polished concrete.

C. Polish

The final step is to polish the floor with progressively finer diamond grits. This polishing procedure is what produces the sheen. A floor can be polished to a matte, medium or high gloss finish. Adding color or seeded material allows for unlimited possibilities for floor design.

Floor polish levels:

- 1) Level 1: Surface preparation, no clarity (below 100 grit)
- 2) Level 2: Hard-shell, satin finish (400 grit)
- 3) Level 3: Hard-shell, medium sheen finish (800 grit)
- 4) Level 4: Light reflective, mirror finish (1800 grit)

3. ESUHSD Lessons Learned

ESUHSD's experience with RetroPlate has resulted in these tips and tricks:

- A. Color: natural concrete is beautiful, and should be considered the standard. Color may be integrated for special installations and locations.
- B. Joints: sawed joints have a more satisfying result than tooled joints. For increased elegance, use Sonatube round forms for footings in lieu of field-formed rectilinear shapes. For an even more elegant solution in new construction installations, bury footings in the slab to eliminate visible form joints.
- C. Protection during construction: No satisfactory chemical or cleaning procedure is available to remove petroleum stains from the concrete surface. Prevention is therefore essential.
 - 1) All hydraulic powered equipment must be diapered to avoid staining of the concrete.

- 2) No trade may park vehicles on the inside slab. If necessary to complete their scope of work, drop cloths will be placed under vehicles at all times.
- 3) No pipe cutting machine may be used on the inside floor slab.
- 4) Steel may not be placed on interior slab to avoid rust staining.
- 5) Acids and acidic detergents may not come into contact with slab.

Slab protection may even include rosin paper, or protective panels of Masonite or plywood.

- D. Sequencing: Be aware of the greater protection required of the floor if polishing activities occur prior to wall erection. Also be aware of the diminished level of treatment that can occur near erected walls.

Approved Manufacturers:

- RetroPlate Concrete Polishing System®

Substitutes Allowed:

Yes, if performance and quality equivalency can be evidenced.

Associated Design Standards and Construction Specifications:

- Not applicable

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